Claims

WHAT IS CLAIMED IS:

1.   An apparatus for performing operations on data within a network, comprising:

a receive module for receiving from a machine in the network a request for an operation

5   to be performed on particular data content;

a store module for locally storing, associated with the machine, information related to the

operation; and

a transmit module, associated with the entity, for implementing the operation and for

transmitting an event relating to the operation for use in communicating the operation to

10   subscribers referencing the machine.

2.   The apparatus of claim 1 wherein the receive module includes a module for receiving an

identification of the machine.

15   3.   The apparatus of claim 1 wherein the receive module includes a module for transmitting a

data cell including the request.

4.   The apparatus of claim 1 wherein the transmit module includes a module for transmitting

a data cell including the event.

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5.   The apparatus of claim 1 wherein the receive module includes a module for receiving an

add, update, delete, or find operation.

6.   An apparatus for generating a subscription to events occurring within a network, comprising:

a generate module for generating a subscription event for a machine in the network using a local notification service;

a transmit module for transmitting the subscription event to a global notification service for registration of the event for subsequent use in notifying the machine of particular events occurring within the network; and

a receive module for receiving from the global notification service a notification of the registration of the event.

7.   The apparatus of claim 6 wherein:

the generate module includes a module for generating an unsubscription event; and

the transmit module includes a module for transmitting the unsubscription event to the global notification service for removing the registration.

8.   The apparatus of claim 6, further including a module for locally storing in a cache associated with the machine information related to the notification.

9.   The apparatus of claim 6, further including a process engine for controlling operation of the local notification service.

10.   An apparatus for broadcasting notification of events occurring within a network, comprising:

a receive module for receiving a broadcast event concerning occurrence of a particular event within the network;

5   a determine module for determining subscribers having subscriptions registered for a notification of the event; and

a transmit module for transmitting the notification to a local notification service associated with each of the subscribers for use in notifying the subscribers of the occurrence of the event.

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11.   The apparatus of claim 10 wherein the determine module includes a module for mapping the broadcast event to the subscribers.

12.   The apparatus of claim 10 wherein the receive module includes a module for receiving an · 15   object as the broadcast event.

13.   The apparatus of claim 10 wherein the determine module includes a module for determining whether each of the subscribers is located remote from the receiving of the broadcast event.

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14.   The apparatus of claim 10 wherein the determine module includes a comparator for matching the subscribers to the subscriptions.

15. The apparatus of claim 10 wherein the determine module includes a module for accessing a global subscriber cache for obtaining mappings between subscribers and subscriptions.

16. The apparatus of claim 10 wherein the transmit module includes a module for transmitting the notification to an event queue associated with the subscribers.

17. An apparatus for downloading files in a network along with changes in a format of the files, comprising:

a receive module for receiving a request for a file including an identifier for the file;

a determine module for determining whether the file exists in an associated memory;

a search module for searching for the file by manipulating the identifier and comparing the manipulated identifier with available files; and

a download module for downloading a located file and associated changes in a format of the file based upon the determining and the searching.

18. The apparatus of claim 17, further including a module for comparing a first time stamp of a first file located from the determining with a second time stamp of a second file located from the searching.

19. The apparatus of claim 18, further including a module for selecting a file for downloading among the first and second files based upon the comparing.

20.   A method for performing operations on data within a network, comprising:

receiving from a machine in the network a request for an operation to be performed on

particular data content;

locally storing, associated with the machine, information related to the operation; and

5   implementing the operation and transmitting an event relating to the operation for use in

communicating the operation to subscribers referencing the machine.

21.   The method of claim 20 wherein the receiving step includes receiving an identification of

the machine.

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22.   The method of claim 20 wherein the receiving step includes transmitting a data cell

including the request.

23.   The method of claim 20 wherein the transmitting step includes transmitting a data cell

15   including the event.

24.   The method of claim 20 wherein the receiving step includes receiving an add, update,

delete, or find operation.

20   25.   A method for generating a subscription to events occurring within a network, comprising:

generating a subscription event for a machine in the network using a local notification

service;

transmitting the subscription event to an LNS from a global notification service for

registration of the event for subsequent use in notifying the machine of particular events

occurring within the network; and

receiving from the global notification service a notification of the registration of the

5   event.

26.   The method of claim 25 wherein:

the generating step includes generating an unsubscription event; and

the transmitting step includes transmitting the unsubscription event from the global

10   notification service to an LNS for removing the registration.

27.   The method of claim 25, further including locally storing in a cache associated with the

machine information related to the notification.

15   28.   The method of claim 25, further including controlling operation of the local notification

service using a process engine.

29.   A method for broadcasting notification of events occurring within a network, comprising:

receiving a broadcast event concerning occurrence of a particular event within the

20   network;

determining subscribers having subscriptions registered for a notification of the event;

and

transmitting the notification to a local notification service associated with each of the

subscribers for use in notifying the subscribers of the occurrence of the event.

30.   The method of claim 29 wherein the determining step includes mapping the broadcast

event to the subscribers.

31.   The method of claim 29 wherein the receiving step includes receiving an object as the

broadcast event.

32.   The method of claim 29 wherein the determining step includes determining whether each

of the subscribers is located remote from the receiving of the broadcast event.

33.   The method of claim 29 wherein the determining step includes using a comparator for

matching the subscribers to the subscriptions.

34.   The method of claim 29 wherein the determining step includes accessing a global

subscriber cache for obtaining mappings between subscribers and subscriptions.

35.   The method of claim 29 wherein the transmitting step includes transmitting the

notification to an event queue associated with the subscribers.

36.   A method for downloading files in a network, comprising:

receiving a request for a file including an identifier for the file;

determining whether the file exists in an associated memory;

searching for the file by manipulating the identifier and comparing the manipulated

identifier with available files; and

5   downloading a located file based upon the determining and the searching.

37.   The method of claim 36, further including comparing a first time stamp of a first file

located from the determining with a second time stamp of a second file located from the

searching.

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38.   The method of claim 37, further including selecting a file for downloading among the

first and second files based upon the comparing.

39.   An article of manufacture specifying a representation of an object stored in a computer-

15   readable storage medium and capable of electronic transmission between machines in a

distributed system, the article of manufacture comprising:

a data cell object to be transmitted in a network, the data cell object including an

indication of code identifying the object, a plurality of content flags identifying types of content

within the object, a plurality of transmission flags specifying how to broadcast the content in the

20   network, and a plurality of error flags specifying errors in the content.

40.   An article of manufacture specifying a representation of an object stored in a computer-readable storage medium and capable of electronic transmission between machines in a distributed system, the article of manufacture comprising:

an enumeration data cell object to be transmitted in a network, the enumeration data cell object specifying an indication of a plurality of data cell objects, each of the data cell objects including a plurality of content flags identifying types of content within the object, a plurality of transmission flags specifying how to broadcast the content in the network, and a plurality of error flags specifying errors in the content.

41.   An article of manufacture specifying a representation of an object stored in a computer-readable storage medium and capable of electronic transmission between machines in a distributed system, the article of manufacture comprising:

an hierarchical data cell object to be transmitted in a network, the hierarchical data cell object specifying an indication of a plurality of data cell objects, each of the data cell objects including a plurality of content flags identifying types of content within the object, a plurality of transmission flags specifying how to broadcast the content in the network, and a plurality of error flags specifying errors in the content, the hierarchical data cell object further specifying a pointer identifying a parent data cell associated with the hierarchical data cell within a hierarchical structure of content.